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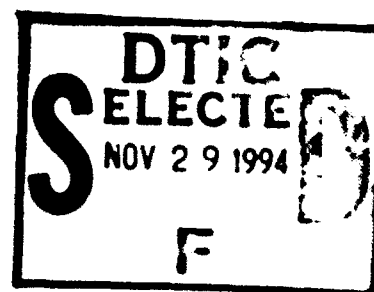
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# Test and Evaluation Master Plan (TEMP) for the Weather Message Switching Center Replacement (WMSCR)

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October 1994  
DOT/FAA/CT-TN94/38

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16. Abstract <p>The Weather Message Switching Center Replacement (WMSCR) Test and Evaluation Master Plan (TEMP) outlines the Test and Evaluation (T&amp;E) process that will be used to ensure that the WMSCR meets the requirements of both the project specification and the requirements allocated from the National Airspace System (NAS) documents. It provides strategy and guidance for test requirements. The WMSCR TEMP has been prepared in accordance with FAA Order 1810.4B and FAA-STD-024a. The WMSCR TEMP follows the requirements defined in FAA-E-2764c, WMSCR Requirements Specification.</p> <p>This TEMP is a high-level document that related required system characteristics and critical issues to test objectives. It addresses Developmental Test and Evaluation (DT&amp;E), Production Acceptance T&amp;E (PAT&amp;E), Operational T&amp;E (OT&amp;E) for NAS Integration (OT&amp;E Integration and OT&amp;E Operational), and OT&amp;E for System Shakedown (OT&amp;E Shakedown). The TEMP also outlines procedures to be followed to ensure the successful integration of the WMSCR system into the NAS. Testing is performed to ensure integration of new subsystems will not degrade the current operations of the NAS.</p> <p>This TEMP relates the T&amp;E efforts to technical risks, operational issues and concepts, system performance, reliability, availability, maintainability, logistics requirements, and schedules. The T&amp;E to be performed to verify software/hardware components and system/NAS level operations of the WMSCR system is addressed in this TEMP.</p>			
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## EXECUTIVE SUMMARY

The Weather Message Switching Center Replacement (WMSCR) Test and Evaluation Master Plan (TEMP) outlines the Test and Evaluation (T&E) process that will be used to ensure the WMSCR meets the requirements of both the project specification and the requirements allocated from the National Airspace System (NAS) documents. It provides strategy and guidance for test requirements.

The WMSCR TEMP has been prepared in accordance with FAA Order 1810.4B and FAA-STD-024a. The WMSCR TEMP follows the requirements defined in FAA-E-2764c, WMSCR Requirements Specification.

This TEMP is a high-level document that relates required system characteristics and critical issues to test objectives. It addresses Developmental Test and Evaluation (DT&E), Production Acceptance T&E (PAT&E), Operational T&E (OT&E) for NAS Integration (OT&E Integration and OT&E Operational), and OT&E for System Shakedown (OT&E Shakedown).

This TEMP outlines procedures to be followed to ensure the successful integration of the WMSCR system into the NAS. Testing is performed to ensure the integration of the new subsystem will not degrade the current operations of the NAS.

This TEMP relates the T&E efforts to technical risks, operational issues and concepts, system performance, reliability, availability, maintainability, logistic requirements, and schedules. The T&E to be performed to verify software/hardware components and system/NAS level operations of the WMSCR system is addressed in this TEMP.

## 1. PURPOSE.

This document is the Test and Evaluation Master Plan (TEMP) for the Weather Message Switching Center Replacement (WMSCR) subsystem of the National Airspace System (NAS) as defined in FAA-E-2764c. This TEMP has been prepared in accordance with FAA Order 1810.4B and FAA-STD-024a.

This TEMP is a high-level document that relates required system characteristics and critical issues to test objectives. It addresses Developmental Test and Evaluation (DT&E), Production Acceptance T&E (PAT&E), Operational T&E (OT&E) for NAS Integration (OT&E Integration and OT&E Operational) and OT&E for System Shakedown (OT&E Shakedown).

This TEMP outlines the T&E process that will be used to ensure the WMSCR meets the requirements of both the project specification and the requirements allocated from the NAS documents. It also provides strategy and guidance for test requirements.

The level of detail contained in this TEMP is only to the extent necessary to support the development of high level schedules for planned tests. This TEMP relates the T&E efforts to technical risks, operational issues and concepts, system performance, reliability, availability, maintainability, logistic requirements, and schedules.

The T&E to be performed to verify software/hardware components and system/NAS level operations of the WMSCR system is addressed in this TEMP.

## 2. REFERENCE DOCUMENTS.

The following specifications, standards, and other documents were used in the development of this TEMP and are referenced herein.

### 2.1 FAA SPECIFICATIONS.

- |    |             |  |
|----|-------------|--|
| a. | FAA-E-2764c | Weather Message Switching Center<br>Replacement System Specification |
| b. | FAA-E-2770b | RADIN Packet Switch Network (PSN)<br>Functional Specification        |

### 2.2 FAA ORDERS.

- |    |                   |   |
|----|-------------------|---|
| a. | FAA Order 7032.3  | Air Traffic Service Operational<br>Requirements for the WMSCR,<br>November 1983 |
| b. | FAA Order 1810.4B | FAA NAS Test and Evaluation Program<br>October 22, 1992                         |

## 2.3 FAA STANDARDS.

- a. FAA-STD-024a Preparation of Test and Evaluation Documentation, August 1987

## 2.4 OTHER FAA DOCUMENTS.

- a. U.S. Department of Transportation, Federal Aviation Administration, Aviation System Capital Improvement Plan, December 1991
- b. NAS-SR-1000 NAS System Requirements Specification with Specification Change Notices (SCN) 1 through 10, November 27, 1991
- c. NAS-SS-1000 NAS System Specification with SCNs 1 through 16, May 1992
- d. NAS-IR-25082507b WMSR/ADAS IRD, August 19, 1986
- e. NAS-IR-25042507 WMSR/AWP IRD, February 19, 1987
- f. NAS-IR-25072505a WMSR/CNSP IRD, February 29, 1991
- g. NAS-IR-92020000c WMSR/Coded Time Source (CTS) Users IRD, July 30, 1991
- h. NAS-IR-51030002b Maintenance Processor System to Automation Subsystems IRD, January 15, 1992
- i. NAS-IR-94012507a WMSR/Message Switch Network Users IRD, February 20, 1991
- j. NAS-IR-43020001c MADIN/X.25 Packet Mode Users IRD, March 5, 1992
- k. NAS-IR-90022507a WMSR/WUSTC (Alphanumeric) IRD, Part I, February 8, 1991
- l. NAS-IR-90022507 WMSR/WUSTC (Graphic) IRD, Part II, February 27, 1987
- m. NAS-IR-94022507b WMSR/Packet Network Users' IRD, February 20, 1992
- n. NAS-IR-25072511b WMSR/RMP IRD, February 20, 1991
- o. NAS-IR-25072513b WMSR/DLP IRD, February 20, 1991
- p. NAS-IR-94032507a WMSR/Asynchronous PAD Users IRD, February 20, 1991
- q. NAS-IR-25072401a WMSR/TMP IRD, February 20, 1991



## 2.5 MISCELLANEOUS.

a. ATC-90-001

NAS Project Master Schedule Baseline  
Report (Published Monthly)

b.

NADIN Packet Switch Network Master Test  
Plan, September 8, 1991

## 3. DESCRIPTION.

### 3.1 MISSION.

The WMSCR system will replace the current Weather Message Switching Center (WMSC) with up-to-date equipment and perform all current weather data handling functions of the WMSC and Notice to Airmen (NOTAM) distribution. It will rely on the National Airspace Data Interchange Network (NADIN) PSN for communications support to distribute both alphanumeric and graphic weather products.

The WMSCR system consists of two identical nodes located at the National Aviation Weather Processing Facility (NAWPF) sites in Salt Lake City, Utah, and in Atlanta, Georgia. Each node will service approximately one-half of the NAS. High operational availability will be achieved by allowing either node to assume complete system operation should one node fail. No perceptible decrease in user service levels will be experienced under single node operation.

### 3.2 SYSTEM SUMMARY.

#### 3.2.1 Key Functions.

The WMSCR system comprises five major functional areas.

##### 3.2.1.1 Communications.

The communications function will provide for the acquisition and dissemination of weather and NOTAM information over the interfacing communications network and dedicated circuits.

##### 3.2.1.2 Processing.

The processing function will identify, validate, and assemble/disassemble products and reports.

##### 3.2.1.3 Storage and Retrieval.

The storage and retrieval function will access WMSCR data bases via a data storage element, a data retrieval element, and a data deletion element.

#### 3.2.1.4 Control.

The control function will consist of the internal monitoring and reconfiguration elements that will perform automatic system control and permit operator initiated system control actions.

#### 3.2.1.5 Development and Testing.

The development and testing function will support system development and testing, hardware and software modification, and system enhancements. It will consist of a software development and test capability and a communications network simulator.

#### 3.2.2 System Interfaces.

The WMSCR system will interface with weather and NOTAM data suppliers and users via dedicated/direct and NADIN PSN communications links.

##### 3.2.2.1 Dedicated/Direct Users.

The WMSCR node will have dedicated communications links with:

- a. The other WMSCR node.
- b. The collocated Aviation Weather Processor (AWP) (see section 2.4.e.).
- c. The Consolidated NOTAM System Processor (CNSP) (see section 2.4.f).

NOTE: The CNSP has never been defined as a formal NAS program. All tests for the CNSP have been deferred. The Consolidated NOTAM System (CNS) will be relocated and an X.25 interface developed for the PSN. The relocated CNS will be tested to WMSCR via the PSN by Engineering, Integration, and Operational Evaluation Service (ACW) and Air Traffic Operational Support Service (AOS). See paragraph 3.2.2.2.1.

##### 3.2.2.2 NADIN PSN Users.

Each WMSCR node will support the following users via the NADIN PSN (see section 2.4.j):

- a. The National Weather Service Telecommunications Gateway (NWSTG) (see sections 2.4.k and 2.4.l).
- b. The Meteorologist Weather Processor (MWP II) and Central Flow MWP (CFMWP) (see section 2.4.m).
- c. Real-time Weather Processors (RWPs) (see section 2.4.n).
- d. Automated Weather Observation System (AMOS) Data Acquisition System (ADAS) (see section 2.4.d).
- e. Leased Service A Systems (see section 2.4.m).
- f. Asynchronous PAD (APAD) users (see section 2.4.p).

g. The U.S. Department of Defense (DOD) via Tinker Air Force Base (KAWN) (see section 2.4.m),

h. The National Severe Storms Forecast Center (NSSFC) (see section 2.4.m),

i. The NADIN Message Switch Network (MSN) Subscribers (see section 2.4.i),

j. Data Link Processor (DLP) formerly the Weather Communications Processor (WCP) (see section 2.4.o),

k. Maintenance Processor Subsystem (MPS) (see section 2.4.h),

l. Traffic Management Processor (TMP) (see section 2.4.q)

m. Consolidated NOTAM System (CNS) interface will be tested to WMSCR via the PSN.

### 3.2.2.3 Coded Time Source.

Each WMSCR node will be capable of receiving a serial coded time data stream from the Coded Time Source (see section 2.4.g) in the collocated AWP. Each node will periodically sample this time data and synchronize the internal nodal system clock.

### 3.2.3 Unique System Characteristics.

#### 3.2.3.1 Single System.

One WMSCR system consisting of two nodes will be developed and produced. The WMSCR will be installed and tested as a total system at the operational sites.

#### 3.2.3.2 Full Period Operations.

The WMSCR system will operate 24 hours a day, 7 days per week with each node responsible for serving approximately half of the NAS.

#### 3.2.3.3 Single Node Full Network.

Either WMSCR node will be capable of assuming full network operations if the other node fails. The system will monitor the status of all system elements, and automatically substitute redundant elements or switch to a backup mode of operation.

#### 3.2.3.4 Status Information Exchange.

The key element of the overall control strategy is the exchange of status information between the nodes. This internodal coordination provides for the transfer of system tasks to the opposing node if either node is in the failure or nodal recovery state.

### 3.3 REQUIRED OPERATIONAL CHARACTERISTICS.

The following functions have been defined as the Air Traffic Service WMSCR operational requirements in FAA Order 7032.3 (see section 2.2.a):

### 3.3.1 Message Processing.

The message processing function will consist of:

- a. Message identification and breakdown by type and/or origin,
- b. Message error detection and correction,
- c. Message storage using append/replace techniques, purge/retain by time of receipt and on-line retention based on report type,
- d. Message routing based on established time intervals and/or priority in appropriate formats,
- e. Message code and format conversion as required for internal storage compatibility and interface requirements,
- f. Input/output message accountability,
- g. Message journalizing,
- h. Message priority for collection and distribution,
- i. Validation of various message fields for report type designator and date/time groups,

### 3.3.2 Request/Reply.

The request/reply service provided will give end users the ability to request and receive weather products not normally received. The WMSCR will have the ability to validate request/reply access.

### 3.3.3 Statistical Collection and Processing.

Statistical collection and processing will provide statistical information on system/network performance including an analysis of individual product activity and identification of inactive products or data.

### 3.3.4 Diagnostic Checks.

Diagnostic checks will generate operator notification for failure detection and reconfiguration.

### 3.3.5 Supervisory Functions.

System supervisory functions will provide the capability for on-line modification of system collection/distribution tables.

### 3.3.6 Weather Data Editing.

A weather data editing capability for messages received in error that are not returned to the sender for correction will be provided.

### 3.3.7 Intercept Function.

The intercept function will provide the capability to initiate message interceptions (off-line storage) for users to maintain accountability in the event of message transmission backlogs.

### 3.3.8 System Reconfiguration.

The system reconfiguration will provide both fail-safe and fail-soft characteristics. Fail-safe will be when a unit or element automatically takes over for a failed component without degrading system operation. Fail-soft will be when no backup element or unit is available, but the system operates in a degraded mode. In the event of a complete system startup, database restoration capabilities will be provided.

### 3.3.9 System Expansion.

A 100-percent system expansion capability will be provided in the initial hardware/software configuration without any changes in the design characteristics.

## 3.4 REQUIRED TECHNICAL CHARACTERISTICS.

The following are the major technical and performance requirements for the WMSCR system as identified in the WMSCR System Specification (see section 2.1.a). The numbers in parentheses provide ready reference to the applicable paragraph in that document.

Reliability, maintainability, and availability (RMA) requirements were verified by analysis during system development and test. All other technical requirements were verified during or prior to the Factory Acceptance Test (FAT).

### 3.4.1 Technical Requirements.

#### a. Reliability (3.4.1)

Mean-Time Between Failures (MTBF) > 1666 hours<sup>1</sup>

#### b. Maintainability (3.4.2)

1. Mean-Time-To-Repair (MTTR) 0.1 hours<sup>2</sup>

2. 85 percent of failures isolated to one LRU<sup>3</sup>

3. 95 percent of failures isolated to two LRU (maximum)

---

<sup>1</sup>For critical equipment (CE) only. CE consists of the central processing unit, the communications equipment supporting the synchronous interfaces to the MADIN PSW, NWID, the primary and secondary storage devices, and the interface supporting at least one operator position.

<sup>2</sup>See previous footnote.

<sup>3</sup>Lowest Repairable/Replaceable Unit.

- |   |  |
|---|--|
| c. Inherent Availability (Ai) (3.4.3)   | 0.9997 <sup>4</sup>                          |
| d. Product Information Database<br>(3.1.4.2.1.2)  | minimum 20,000 entries                       |
| e. On-line Event Log<br>(3.1.4.4.1.4.6)   | minimum 24 hours                             |
| f. Data Storage Capacity<br>(3.1.4.1.2.9)   | 6 hours/interface                            |
| g. Operate with no air conditioning<br>(3.1.4.4.1.3.1.3.)                                 | (minimum) 20 minutes                         |
| h. Survive power interruptions<br>(with no loss of volatile memory)<br>(3.1.4.4.1.3.1.3.) | (maximum) 2.0 minutes                        |
| i. Reconfigure for failed hardware<br>(subscriber outage)<br>(3.1.4.4.1.3.1.2)            | (maximum) 10 seconds<br>(maximum) 10 seconds |

### 3.4.2 Performance Requirements.

#### 3.4.2.1 Processing Performance (3.1.4.2.6).

	Mean (in seconds)	95th percent
a. Data Identification, Validation, and Distribution	15.0	30.0
b. Data Requests and Urgent Products	1.0	3.0
c. Product Assembly	30.0	60.0

#### 3.4.2.2 Data Storage and Retrieval (3.1.4.3.6).

	Mean (in seconds)	95th percent
a. Product and Report Storage	10.0	20.0
b. Product Retrieval	A	B

where:  $A = 2.5 + 0.002 \times (\text{product size in bytes})$  and,

$B = 15.0 + 0.005 \times (\text{product size in bytes})$

---

<sup>4</sup>Exclusive of CE and Federal Aviation Administration (FAA) provided air conditioning and power.

c. Report Retrieval

C

D

where:  $C = 5.0 + 0.002 \times (\text{product size in bytes})$  and,

$D = 20.0 + 0.005 \times (\text{product size in bytes})$

d. Weather Data Deletion

Maximum 5 Minutes  
(after purge time)

e. NOTAM Data Deletion

Maximum 30 seconds  
(after receipt of file from CNSP)

3.4.2.3. Internodal Coordination (3.1.4.4.3.1).

a. Input Data Coordination

Maximum 30 seconds  
(after identification of incoming product)

b. Output of Data Coordination

Maximum 30 seconds  
(after completion of product transmission)

c. Database Coordination

Maximum 10 seconds  
(after change completed at one node)

3.4.2.4 Operator Command Functions (3.1.4.4.3.3)<sup>5</sup>.

	Mean (in seconds)	95th percent
a. Status display commands	1.0	3.0
b. Display product or report	1.0	3.0
c. Activate/deactivate log printer	1.0	3.0
d. Audible alarm response	1.0	3.0
e. Scan for further errors/ terminate editing	1.0	3.0
f. Delete 10 elements from Comm Data Storage	2.5	5.0
g. Initiate editing/ return product for distribution	3.0	5.0
h. Start off-line formal transfer	3.0	5.0
i. Display event log	3.0	5.0

<sup>5</sup>For global operations on the Product Information Database (PIDB), Station Identification Database (SIDB) and dynamic databases, each operator command is allowed an additional 2.5 seconds for each 1,000 entries in the PIDB or SIDB.

j. Database Element Updates	3.0	5.0
k. Retrieval from Data Storage	3.0	5.0
l. Circuit/Alternate Activate/Deactivate	3.0	5.0
m. Delete a product or report	3.0	5.0
n. Circuit reconfiguration	5.0	10.0
o. Modify collective breakdown	5.0	10.0
p. Modify data retrieval adaptation database	5.0	10.0

### 3.5 CRITICAL TEST AND EVALUATION ISSUES.

The following are the critical technical and operational issues to be resolved during the WMSCR test and evaluation process.

#### 3.5.1 Technical Issues.

The following paragraphs discuss the critical technical issues associated with the development and implementation of the WMSCR system.

a. System Performance Under Load. The WMSCR must meet the following technical performance requirements under the traffic loads identified in appendix II of the FAA-E-2764c, WMSCR System Specification:

1. Data retrieval per paragraph 3.1.4.3.6.3 of FAA-E-2764c in the dual and single node configurations under the "peak plus margin" traffic load.
2. Processing performance per paragraph 3.1.4.2.6 of FAA-E-2764c in the dual and single node configurations under the "peak plus margin" traffic load.
3. Operator command response times per paragraph 3.1.4.4.3.3 of FAA-E-2764c in the dual and single node configurations under the "peak" and "peak plus margin" traffic loads.

b. Data Format Processing. Due to the evolving and nonstandard use of the various data formats, the WMSCR must be capable of processing all the various data formats that will exist at the time of deployment.

c. NADIN PSN Availability. The availability of the NADIN PSN is considered a critical technical issue in that the WMSCR interface to the PSN must be tested and approved prior to testing the communications with the weather data end-users via the PSN.

#### 3.5.2 Operational Issues.

The critical operational issues to be resolved concern conformance testing for the WMSCR and user systems on the NADIN PSN.



#### 3.5.2.1 WMSCR/PSN Conformance.

PSN conformance is critical in that WMSCR communications with most end-users will be connected via the NADIN PSN. Those users that are to connect to the PSN must be subjected to and pass the NADIN PSN conformance test. Delays in the PSN may result in significant delays in WMSCR OT&E and deployment. Without the PSN, the WMSCR system can only support the AWP. Without the PSN, WMSCR cannot complete the required OT&E, and consequently cannot become operational.

#### 3.5.2.2 User Availability.

User availability is critical in that each type of user must be represented during OT&E. Table 3.5.2.2-1 shows all the WMSCR system interfaces grouped by the communications path to the WMSCR, their tentative Operational Readiness Date (ORD) and their availability for OT&E based on the completion of WMSCR Site Acceptance Test (SAT) in April 1992.

#### 3.5.2.3 User/PSN Conformance.

All PSN users must also pass the NADIN PSN conformance test prior to being allowed to connect to the PSN. While the PSN project will provide the conformance test tool, the management and technical aspects of the conformance testing have yet to be identified.

#### 3.5.2.4 Simulated versus On-line Inputs.

As reflected in table 3.5.2.2-1, not all WMSCR system interfaces will be available for testing. Each WMSCR node contains a built-in simulation function that will be used to test the system interfaces to baselined IRD requirements. Specific requirements for the use of the WMSCR simulation function will be defined in the plans for OT&E.

3.5.2.5 Test Databases/Sets. Test databases and test data sets were to be developed and updated to ensure that they provide complete WMSCR testing scenarios, especially in regard to message types and frequency of arrivals. Requirements for test databases and test data sets development and maintenance were reflected in the plans for contractor testing and are being developed for OT&E.

TABLE 3.5.2.2-1. WMSCR INTERFACE SYSTEM AVAILABILITIES

Comms Path	System	1st ORD	Last ORD	OT&E Availability
Direct	AWP	N/A	N/A	Available
	CTS	N/A	N/A	Available
	NADIN PSN ORD	N/A	Oct 94	Available
	CNSP	N/A	N/A	Deferred
NADIN	Airlines(X.25)	Unknown	Unknown	Unknown
Direct	NWSTG	N/A	N/A	Available
	ADAS	Jul 93	Apr 95	Available
	DLP	1996	1996	Deferred
	APAD	N/A	N/A	Part of PSN
	CNS	N/A	N/A	Available
	KAWN/DOD	N/A	N/A	Available
	Service A Gateway	N/A	N/A	Available
	MPS	N/A	N/A	Deferred
	NSSFC	N/A	N/A	Available
	MSN Gateway	Aug 94	N/A	Available
	MWP II/CFMWP	Mar 96	Aug 96	Deferred
	RWP	TBD	TBD	Deferred
	DUAT Recompete	1994	1994	Deferred
	TMP	TBD	TBD	Deferred
PSN/APAD	Circuit 604	N/A	N/A	Available
	Airlines	N/A	N/A	Available
PSN/ SA/GWY	FSDPS	N/A	N/A	Available
	DUAT	N/A	N/A	Available

#### 4. PROGRAM SUMMARY.

##### 4.1 MANAGEMENT.

This section describes the management responsibilities of the organizations participating in and supporting the WMSCR Test and Evaluation (T&E) program.

##### a. Test Policy Review Committee (TPRC)

1. Approves the WMSCR TEMP.
2. Approves test policy waivers.

3. Resolves disagreements on T&E issues when agreements cannot be reached at lower levels of FAA management.

4. Chairperson assumes responsibility of making final decisions on actions brought before the TPRC.

b. Deputy Associate Administrator for System Engineering and Development (ASD)

1. Provides Program Managers (via ARD) for NAS Acquisition projects.

2. Appoints Chairperson of the TPRC.

c. NAS System Engineering Service (ASE).

1. Reviews the WMSCR TEMP.

2. Provides the NAS-SS-1000, System Specification requirements for inclusion in the WMSCR TEMP.

d. Engineering Specialties and Configuration Management Division (ASE-600)

1. Serves as a Secretariat for the TPRC.

2. Verifies compliance with FAA Orders and standards related to T&E using TPRC approved processes.

e. National Airspace System (NAS) Transition and Implementation Service (ANS)

1. Serves as a member of the TPRC.

2. Provides supportability requirements to the Associate Project Manager for Test (APMT) for inclusion in the WMSCR TEMP, which serves as guidance to ASM for the OT&E Shakedown plan.

3. Reviews the WMSCR TEMP.

4. Reviews requirements, plans, and procedures for OT&E Shakedown.

5. Provides personnel for conducting and/or monitoring the conduct of OT&E Shakedown.

6. Reviews OT&E Shakedown reports.

f. NAS Development Service (AND-3)

1. Serves as a member of the TPRC.

2. Reviews the WMSCR TEMP.

g. Facility System Engineering Service (AFE)

1. Identifies NAS system level requirements for inclusion in WMSCR test plans, and verifies that they are satisfied during the WMSCR T&E program.

2. Prepares the NAS-SS-1000 (volume VI) system specification requirements for inclusion in the WMSCR TEMP VRTH.

h. Weather and Flight Service (ANW)

1. Serves as a member of the TPRC.
2. Provides the WMSCR Program Manger (PM).
3. Reviews the WMSCR TEMP.

i. Program Manager (PM) (ANW-200)

1. Responsible for overall management of the WMSCR project.
2. Presents T&E deployment issues to the DRR.
3. Arranges with APMT for T&E support, coordination, and monitoring through an annual Program Directive (PD).
4. Approves PDs.
5. Tasks the APMT to prepare PDs between the program office and other FAA organizations.
6. Requests funding for WMSCR T&E.
7. Responsible for receiving TPRC approval for the WMSCR TEMP.
8. Prepares test policy waiver requests and submits to Secretariat via the Service Director or Program Director, as appropriate.
9. With APMT support, brings unresolved T&E issues before the TPRC via the TPRC Secretariat.
10. Arranges DT&E/PAT&E support, and provides technical direction for DT&E.
11. Reviews DT&E and PAT&E plans, procedures, and reports.
12. Recommends approval of contractor DT&E and PAT&E plans, procedures, and reports to the Contract Officer (CO).
13. Monitors DT&E.
14. Reviews and approves OT&E Integration and OT&E Operational test requirements, plans, procedures, and reports.

15. Monitors OT&E Integration and OT&E Operational tests.
  16. Monitors OT&E Shakedown.
  17. Distributes the WMSCR TEMP and DT&E/PAT&E plans, procedures, and reports.
- j. Director, FAA Technical Center (ACT) and Engineering, Integration, and Operational Evaluation Service (ACW)
1. Serves as a member of the TPRC.
  2. Provides the APMT for WMSCR as agreed to with ACN/ACW.
  3. Reviews WMSCR TEMP.
  4. Reviews OT&E Integration and OT&E Operational requirements.
  5. Provides concurrence with OT&E Integration and OT&E Operational plan, procedures, and reports prior to review.
  6. Presents unresolved T&E issues, significant problems with test results, or T&E policy violations to the TPRC.
  7. Provides T&E assessments to the Deployment Readiness Review (DRR) process.
- k. Associate Project Manager for Test (APMT)
1. Acts as the agent of the PM to oversee the T&E program.
  2. Prepares, coordinates, and approves with the PM, an annual PD which addresses all T&E activities for WMSCR.
  3. Prepares appropriate T&E inputs to project documents as tasked in PDs.
  4. Prepares PDs between the project office and other FAA organizations to fund and/or arrange for the organizations' participation/support of T&E activities.
  5. Jointly prepares and updates the WMSCR TEMP with the PM.
  6. Provides updates of available test results to the DRR.
  7. Reviews DT&E requirements, plans, procedures, and reports.
  8. Coordinates with performing organizations and monitors DT&E, PAT&E, and OT&E activities.
  9. Reviews contractor-prepared DT&E plans, procedures, and reports.

10. Monitors DT&E performed by the contractor.
  11. Reviews PAT&E requirements, plans, procedures, and reports.
  12. Prepares OT&E Integration and OT&E Operational requirements for inclusion in the WMSCR TEMP.
  13. Prepares OT&E Integration and OT&E Operational plans, procedures, and reports.
  14. Reviews OT&E Shakedown requirements, plans, and procedures.
  15. Conducts and directs OT&E Integration and OT&E Operational testing.
  16. Monitors OT&E Shakedown and reviews reports.
1. Air Traffic Operational Support Service (AOS)
    1. Serves as a member of the TPRC.
    2. Identifies and develops with the PM and APMT, the OT&E Shakedown requirements for the WMSCR TEMP.
    3. Reviews and approves PDs, as required.
    4. Reviews the WMSCR TEMP.
    5. Monitors DT&E.
    6. Reviews OT&E Integration and OT&E Operational test requirements, plans, and reports.
    7. Monitors OT&E Integration and OT&E Operational tests.
    8. Prepares OT&E Shakedown requirements, plans, procedures, and reports in coordination with ATR.
    9. Approves, in coordination with ATR, additional OT&E Shakedown requirements that do not exceed OT&E Shakedown test durations, or associated costs, baselined in the WMSCR TEMP.
    10. Approves OT&E Shakedown plans, procedures, and reports.
    11. Directs and conducts OT&E Shakedown as applicable to AOS OT&E requirements.
    12. Provides personnel for performing and/or monitoring the conduct of OT&E Shakedown.

13. Conducts OT&E Shakedown data analysis and prepares OT&E Shakedown reports.

14. Provides a deployment recommendation based on OT&E Shakedown results in support of the DRR.

m. Air Traffic Plans and Requirements Service (ATR)

1. Serves as a member of the TPRC.

2. Provides requirements for and reviews the WMSCR TEMP.

3. Reviews and approves PDs, as required.

4. Provides operational expertise and planning for conducting and analyzing tests.

5. Reviews DT&E and PAT&E requirements.

6. Provides and reviews requirements, plans, and procedures for OT&E Integration and OT&E Operational and OT&E Shakedown.

7. Provides and approves additional test requirements that do not exceed durations or costs as baselined in the baselined WMSCR TEMP.

8. Provides personnel for conducting and/or monitoring the conduct of OT&E Integration and OT&E Operational tests and OT&E Shakedown.

9. Reviews OT&E Integration and OT&E Operational test, and OT&E Shakedown reports.

10. Provides a deployment recommendation based on the results of OT&E Shakedown in support of the DRR.

n. Acquisition Support (ASU)

1. Serves as a member of the TPRC.

2. Reviews the WMSCR TEMP.

3. Reviews contractor TEMP and all DT&E/PAT&E plans, procedures, and reports.

4. Reviews and approves PDs, as required.

5. Verifies completeness of program by receiving the final reports of OT&E Integration and OT&E Operational testing, and OT&E Shakedown.

o. FAA Contracting Officer (CO)

1. Approves DT&E plans, procedures, and reports for contractual compliance.

2. Ensures DT&E is conducted in accordance with the terms of the contract.

3. Approves PAT&E plans, procedures, and reports for contractual compliance.

p. Contracting Officer's Technical Representative (COTR)

1. Reviews DT&E plans, procedures, and reports.

2. Reviews PAT&E plans, procedures, and reports.

q. Quality Reliability Officer (QRO)

1. Monitors DT&E.

2. Monitors PAT&E. Accepts or rejects the WMSCR as directed by the CO.

3. Reviews DT&E and PAT&E plans, procedures, and reports.

4. Ensures DT&E and PAT&E are conducted in accordance with the terms of the contract.

r. Regional Airway Facilities Divisions (AFD)

1. Supports PM in the development of test requirements.

2. Supports PM in the implementation of WMSCR test program at Salt Lake City, Atlanta, and Leesburg.

3. Supports and participates in all phases of OT&E in the field.

4. Conducts Joint Acceptance Inspections (JAI).

s. Airway Facilities Sectors (AFS)

1. Participates in WMSCR tests activities as required by AFD.

2. Participates in the JAI.

t. System Engineering and Integration Contractor (SEIC)

1. Provides project management planning and technical support for the PM and APMT.

2. Provides T&E support to ACW-200, the PM, and the TD.

u. Test Teams - Test teams for monitoring and performing test activities will consist of the TD, coordinators, managers, operators, and observers, as required. Specific positions, duties, and responsibilities will be defined in the appropriate test plans.



## 4.2 INTEGRATED SCHEDULE.

Figure 4.2-1 shows the flow of activities for the WMSCR testing and evaluation effort. Major milestones and dates of the WMSCR testing program are found in the current NAS Master Schedule Baseline Report (NMSBR). Table 4.2-1 shows the milestones and dates from the January 1992 NMSBR.

## 4.3 TEST PLANS.

This section defines the series of test plans that have been developed for the WMSCR project. This section discusses both contractor (Harris Corporation) and government test plans. Each test plan will be supported by formal test procedures and test reports. All plans and procedures require FAA Program Manager approval prior to the conduct of the tests.

### 4.3.1 Contractor Test Plans.

Harris Corporation has provided the following test plans.

#### 4.3.1.1 Contractor Test Plan.

The Contractor Test Plan (CTP) defines the overall test philosophy and summarizes all tests conducted by Harris Corporation. It defines the approach and concepts for implementing and controlling the Harris test program. It defines organizational roles and responsibilities, and provides a flow diagram for all Harris tests. The CTP was prepared in accordance with FAA-STD-024a, appendix II. Revision D1 was approved February 3, 1990.

#### 4.3.1.2 Software Test Plan.

The Software Test Plan (STP) defines the total scope of testing for a particular Computer Software Configuration Item (CSCI). For the WMSCR, there are three STPs; one for the NWID, one for the Test Bed (TBED), and one for the Operations (OPS) and Distribution (DIST) CSCIs. The STPs establish requirements, describe organizations and responsibilities, specify resources required, and provide schedules for all CSCI testing. The STPs identify the individual tests to be performed during CSCI testing, form the basis for the development of both formal and informal tests and have enabled the FAA to assess the adequacy of CSCI test planning. The STPs also identify the requirements for the integration of the individual CSCIs into the aggregate WMSCR system. The STPs were developed in accordance with Data Item Description (DID), DI-MCCR-80014, as referenced in the WMSCR contract. The latest revised STPs were approved on March 3, 1991.

DT6E							PAT6E			OT6E	
SSR	POR	CDR	UT	TBR	SIT	FQR	PAT	I/CO	SAT	I N T E G R A T I O N	
Contractor Facility								ZDC			S H A K E D O W N
								ATL			
								SLC			
											DRR
											JAI
											ORD

Legend:	
ATL - Mode at Atlanta, GA NAMPF	OT&E - Operational T&E
CDR - Critical Design Review	PAT&E - Production Acceptance T&E
ZDC - MWID at Leesburg, VA	PDR - Preliminary Design Review
DRR - Deployment Readiness Review	SAT - Site Acceptance Test
DT&E - Development T&E	SLC - Mode at Salt Lake City, UT NAMPF
FAT - Factory Acceptance Test	SIT - System Integration Test (includes CSCI tests)
FQR - Formal Qualification Review	SSR - Software Specification Review
I/CO - Installation and Check Out	T&E - Test and Evaluation
JAI - Joint Acceptance Inspection	TRR - Test Readiness Review
ORD - Operational Readiness Date	UT - Unit Test
	(incl CSC Integration tests)

FIGURE 4.2-1. WMSCR TEST AND EVALUATION FLOW

TABLE 4.2-1. WMSCR MILESTONES

Completed Milestones	Date Completed	
Contract Award	07/88	
PDR	07/89	
CDR	01/90	
CSCI Tests	09/91	
Factory Acceptance Test	04/92	
Site Acceptance Test	05/92	
OT&E Integration and OT&E Operational Phase I	03/93	
Scheduled Milestones	Start	Completed
OT&E Integration and OT&E Operational Phase II	06/94	07/94
Regression	07/94	07/94
OT&E Shakedown	08/94	08/94
DRR		09/94
ORD		09/94
TRANSITION	09/94	12/94

#### 4.3.1.3 Factory Acceptance Test Plan.

The FAT was performed to validate the function of the system at the contractor's test facility and was witnessed by the FAA. The FAT demonstrated the adequacy of the WMSCR design by testing all aspects of system function and performance, as defined in the system specification. The FAT plan defined the range of tests, input data, initialization requirements, expected output, and test success criteria. Testing resources such as personnel, equipment facilities, and schedules were identified. Upon the successful completion of the FAT, the WMSCR was transported to and installed in its intended field environment.

System performance testing during FAT was performed under:

- a. Normal data flow and normal operating conditions,
- b. Limit and overload conditions,
- c. Erroneous data input and abnormal operating conditions,
- d. Failure and recovery conditions.

The FAT Plan was prepared in accordance with appendix II of FAA-STD-024a and approved on November 8, 1991.

#### 4.3.1.4 Site Acceptance Test Plan.

The SAT was performed to validate the function and performance of the system (previously demonstrated by the FAT at the contractor's test facility) in its intended field test environment. This test used all available actual field stimuli and inputs. Field inputs not available were simulated using the WMSCR built-in simulator function. The SAT plan defined the range of tests, system initialization requirements, input data, expected output, and criteria for evaluation. Test resources such as personnel, equipment, facilities, and schedules were also identified.

System performance testing for the SAT was performed under:

- a. Normal data flow and normal operation conditions,
- b. Failure and recovery condition.

The SAT plans were prepared in accordance with appendix II of FAA-STD-024a. The NWID SAT plan was approved on April 29, 1991. The SAT plans for the nodes were approved in February 1992.

#### 4.3.2 FAA Test Plans.

##### 4.3.2.1 OT&E Integration and OT&E Operational Plan.

The OT&E Integration and OT&E Operational plan defines the scope of the operational testing to be performed to integrate the WMSCR into the NAS environment. The plan covers basic interface and intersystem communications. At the NAS level, data flows to and from available end-users will be verified and will include operational command and request/reply sequences with available representation from each user category.

The OT&E Integration and OT&E Operational plan was prepared by ACW-200 in accordance with appendix II of FAA-STD-024a and approved in October 1991.

#### 4.3.2.2 OT&E Shakedown Plan.

The OT&E Shakedown plan defines the scope of the operational testing to be performed to verify the operational effectiveness and suitability of the WMSCR for use in the NAS. OT&E Shakedown will determine the operational readiness of personnel, procedures, and the system to assume field operational status.

The OT&E Shakedown plan was prepared by AOS-530 in accordance with appendix II of FAA-STD-024a. As necessary to ensure an effective shakedown, AOS-530 has coordinated OT&E requirements with the cognizant Air Traffic (AT) organizations. The OT&E Shakedown plan was approved on February 11, 1991.

### 5. DEVELOPMENTAL TEST AND EVALUATION/PRODUCTION ACCEPTANCE TEST AND EVALUATION (DT&E/PAT&E).

#### 5.1 DT&E/PAT&E TO DATE.

##### 5.1.1 Contractor Informal DT&E.

All informal contractor testing has been completed. All Unit, Computer Software Component (CSC) and CSC Integration testing was successful. There are no carry-over action items resulting from these informal tests.

##### 5.1.2 Contractor Formal DT&E/PAT&E.

All formal CSCI tests, FAT, and SAT tests have been completed. All required test reports have been reviewed and approved by the Program Office. There are no carry-over action items resulting from these formal tests.

##### 5.1.2.1 Functional Tests.

The following are the functions evaluated during the FAT (DT&E) and SAT (PAT&E):

a. System failures and reconfiguration. Elements of the WMSCR node were selectively failed to demonstrate that the system successfully substitutes redundant elements with no impact on system operation.

b. Processor failover. One VAX 6220 processor at a node was failed to demonstrate the failover to the backup processor with no more than a 10-second interruption in user service.

c. Nodal switchover. One node was failed to demonstrate that the system is capable of resuming service to all users in the single node configuration.

d. Nodal startover. The failed node was restarted after a failure and brought back to fully operational condition including the resumption of service to users.

e. Operator takeover. This test demonstrated the WMSCR capability to allow the operator at one node to perform the coordination and actions necessary to assume control of the complete WMSCR network at one node.

#### 5.1.2.2 Performance Tests.

The following performance tests were accomplished during the FAT (DT&E) and SAT (PAT&E):

a. Data retrieval performance tests were performed in the single and dual node configurations under the "peak + margin" traffic load as defined in appendix I, section 10 of FAA-E-2764c. These tests will verify the requirements of paragraph 3.1.4.3.6.3 of FAA-E-2764c.

b. Processing performance tests were also performed in the single and dual node configurations under the "peak + margin" traffic load as defined in appendix I, section 10 of FAA-E-2764c. These tests will verify the requirements of paragraph 3.1.4.2.6 of FAA-E-2764c.

c. Operator command performance tests were performed in the dual node configuration under the "peak" traffic load as defined in appendix I, section 10 of FAA-E-2764c. These tests verified all requirements associated with operator command responses as defined in FAA-E-2764c.

#### 5.2 FUTURE DT&E/PAT&E.

##### 5.2.1 Future DT&E.

None. All contractually required DT&E has been completed.

##### 5.2.1.1 Future DT&E Objectives.

Not applicable.

##### 5.2.1.2 DT&E Events/Scope of Testing/Basic Scenarios.

Not applicable.

##### 5.2.2 Future PAT&E.

None. All contractually required PAT&E has been completed.

##### 5.2.2.1 Future PAT&E Objectives.

Not applicable.

##### 5.2.2.2 PAT&E Events/Scope of Testing/Basic Scenarios.

Not applicable.

### 5.3 CRITICAL DT&E/PAT&E ISSUES.

#### 5.3.1 Critical DT&E Issues.

Issues resolved at the FAT were:

- a. Key system functions as previously discussed in paragraph 5.2.1.2.1.
- b. System performance as previously discussed in paragraph 5.2.1.2.2.

#### 5.3.2 Critical PAT&E Issues.

##### 5.3.2.1 Interface Availability for SAT.

No actual system interfaces were available for the SAT. The WMSCR built-in simulator was used to verify the operation of the interfaces. Testing with live interfaces has been postponed into OT&E Integration and OT&E Operational or deferred as indicated in section 4 and the appendix A, Test Verification Requirements Traceability Matrix (TVRTM).

##### 5.3.2.2 Test Data Sets for SAT.

The test data sets to be used with the Network Simulator were developed to provide realistic and adequate test scenarios.

### 6. OPERATIONAL TEST AND EVALUATION (OT&E)/INTEGRATION.

#### 6.1 OT&E INTEGRATION AND OT&E OPERATIONAL TO DATE.

The OT&E Integration and OT&E Operational is in progress. As test results are published, they are distributed for review. To date, the following OT&E Integration and OT&E Operational reports have been completed:

- a. WMSCR/NMC Quick Look Report 1/93.
- b. WMSCR/NADIN II Quick Look Report 1/93.
- c. WMSCR/WMSCR Operator Quick Look Report 2/93.
- d. WMSCR/Other WMSCR Internodal Quick Look Report 3/93.
- e. WMSCR/CTS Quick Look Report 4/93.
- f. WMSCR/ADAS Interim Test Report 10/93.
- g. WMSCR/NSSFC Alternate Link Test Report 1/94.

#### 6.2 FUTURE OT&E INTEGRATION AND OT&E OPERATIONAL.

##### 6.2.1 OT&E INTEGRATION AND OT&E OPERATIONAL OBJECTIVES.

The OT&E Integration and OT&E Operational will verify WMSCR operational requirements at the NAS system and subsystem levels in accordance with volumes I, II, and V of NAS-SS-1000.

The OT&E Integration and OT&E Operational will verify the ability of the WMSCR to properly interface and function with other NAS subsystems and to verify the operational effectiveness and suitability of the WMSCR when fully integrated into the NAS.

The WMSCR OT&E Integration and OT&E Operational will be conducted by ACW-200B at the Salt Lake City, Atlanta, and Leesburg operational test sites. In accordance with FAA Order 1810.4B, all WMSCR related subsystem interfaces will be tested. Where the actual subsystem is not available, emulation of that NAS subsystem will be used, except in those cases where the subsystem has not yet been baselined. In these cases, the NAS-SS-1000 requirements will be deferred.

#### 6.2.2 OT&E Integration and OT&E Operational Events/Scope of Testing/Basic Scenarios.

A building block approach will be employed in the implementation of the WMSCR OT&E Integration and OT&E Operational process. This approach provides an orderly sequence of tests to establish baseline performance.

The following sequences will be used as a reference point to construct a test baseline for the operational WMSCR system. This baseline will include gathering a weather and NOTAM information database that will be used in conjunction with the distribution and communications functions.

a. Initial WMSCR OT&E Integration and OT&E Operational will begin with a subset of WMSCR operator functions which will include startup procedures, diagnostics, and system configuration parameters.

b. National Meteorological Center (NMC) - WMSCR. This test will obtain and verify an operational database in accordance with Federal Coordinator for Meteorological Service Standards (FCM-S2) and World Meteorological Organization (WMO) weather format standards. After obtaining a valid weather database, the WMSCR operator console will be exercised.

c. WMSCR - Aviation Weather Processor (AWP). This test will verify the ability of the WMSCR to exchange NOTAM and weather data with the AWP.

d. Coded Time Source (CTS) to WMSCR. This test will verify WMSCR synchronization with the CTS.

e. WMSCR - CNSP. Testing with the CNSP is deferred. This group of tests will be structured to test the existing CNS to WMSCR after CNS has been relocated and an X.25 interface has been developed. This test will verify that WMSCR is capable of receiving unprocessed NOTAMs from the subsystems/users, forwarding them to the CNS, and accepting processed NOTAMs from the CNS for distribution to the subsystem/users.

f. WMSCR - NADIN II PSN. The PSN X.25 protocol conformance process to be described and defined by the FAA will be executed prior to any further testing with WMSCR users over the PSN.



g. WMSCR - PSN Users. Upon successful verification of the NAS requirements for the above sequences (a. through f.), WMSCR OT&E Integration and OT&E Operational will verify the interface requirements of the users that employ the NADIN PSN as an intermediate pathway.

The WMSCR OT&E Integration and OT&E Operational supports string testing through the NADIN PSN to the end-state subsystem, however, does not assume responsibility for the success or failure of that string.

The WMSCR/NADIN PSN users by design have common interface characteristics. The testing of WMSCR/NADIN PSN users will verify the general requirements of the WMSCR to distribute weather and NOTAM information to each of the users. The unique weather and NOTAM requirements for each user will be tested. Testing will verify the capability of WMSCR to store data received from users and to selectively distribute required data to each user. WMSCR support of existing user request/reply services will also be evaluated as necessary.

### 6.2.3 Test Configurations and Categories.

The WMSCR OT&E Integration and OT&E Operational will employ five configurations which represent logical groups within the NAS environment. Within each test configuration are test categories which represent the WMSCR subsystems/users. Each category will verify the WMSCR processing and distribution functions for weather and NOTAM message types and operational interface requirements. The test categories will provide a uniform interface for testing data formats and procedures for all communications circuits, independent of the data types, protocols, and formats in use on the circuit.

The test configurations and categories are:

#### 6.2.3.1 Test Configuration #1.

Test Configuration #1 will test the communications function of those NAS subsystems/users that are directly connected to a WMSCR node.

<u>Category</u>	<u>Subsystem/User</u>
A	WMSCR Operator;
B	National Meteorological Center (NMC);
C	Aviation Weather Processor (AWP);
D	Coded Time Source (CTS);
E	Consolidated NOTAM System Processor (CNSP);

NOTE: CNSP tests are deferred. CNS will be tested to WMSCR via the PSN.

#### 6.2.3.2 Test Configuration #2.

Test Configuration #2 will test the communications function of those NAS subsystems which interface to the WMSCR node as WMSCR/NADIN PSN users.

<u>Category</u>	<u>Subsystem/User</u>
F	Other WMSCR Node
G	Central Flow Meteorologist Weather Processor (CFMWP)
H	Real-Time Weather Processor (RWP)
I	Automated Weather Observation System Data Acquisition System (ADAS)
J	Department of Defense/Tinker Air Force Base (DOD/AWN)
K	National Severe Storms Forecast Center (NSSFC)
L	Data Link Processor (DLP)
M	Maintenance Processor Subsystem (MPS)
N	Traffic Management Processor (TMP)
O	Meteorologist Weather Processor (MWP)
P	Direct User Access Terminal (DUAT)
Q	Graphics Weather Display System (GWDS)
R	External Users (External to the NAS)

#### 6.2.3.3 Test Configuration #3.

Test Configuration #3 will test the communications function of those NAS subsystems which interface to the WMSCR node as WMSCR/NADIN MSN users.

<u>Category</u>	<u>Subsystem/User</u>
S	External Users; (e.g., Host)
T	International Users; (e.g. Aeronautical Fixed Telecommunications Network (AFTN))

#### 6.2.3.4 Test Configuration #4.

Test Configuration #4 will test the communications function of those NAS subsystems which interface to the WMSCR node as WMSCR/NADIN APAD users.

<u>Category</u>	<u>Subsystem/User</u>
U	External Users; (e.g., commercial airlines)

#### 6.2.3.5 Test Configuration #5.

Test Configuration #5 will test the communications functions for the total system network of WMSCR users.

<u>Category</u>	<u>Subsystem/User</u>
V	Total WMSCR System Performance, Capacity and Expansion

### 6.3 CRITICAL OT&E INTEGRATION AND OT&E OPERATIONAL ITEMS.

#### 6.3.1 Available Interfaces.

Interfaces that will be available for OT&E Integration and OT&E Operational and those that may require simulators or drivers must be identified during the development of the OT&E Integration and OT&E Operational plan and procedures. The start of OT&E Integration and OT&E Operational for configurations 2 through 5, listed in section 6.2.3, is dependent upon the availability of the NADIN PSN. See also paragraph 3.5.2.2 and table 3.5.2.2-1 of this TEMP.

#### 6.3.2 PSN Conformance.

Prior to connection to the PSN for either testing or operation, each user will be required to go through the NADIN PSN conformance verification process.

### 7. OT&E/SHAKEDOWN.

Shakedown testing is planned and conducted by AOS-530. As the final phase of OT&E, the purpose of Shakedown is to evaluate the system in its operational environment. Shakedown testing verifies the integrated readiness of personnel, procedures, and the system to assume field operational status.

Shakedown testing focuses on man-machine interface and system support issues. Test issues include human factors of using and maintaining the system, and include programs developed concurrently with the system including logistics support, training, procedures, and documentation. These programs have been evaluated individually during system development. Shakedown testing is an evaluation of the integrated effectiveness of these programs to determine the suitability and maintainability of the system prior to implementation into the NAS.

#### 7.1 OT&E SHAKEDOWN TO DATE.

None to date.

#### 7.2 FUTURE OT&E SHAKEDOWN.

##### 7.2.1 OT&E Shakedown Objectives.

OT&E Shakedown testing is performed on the system to determine the system operational effectiveness and suitability. Operational effectiveness is defined as the degree to which the system accomplishes its mission in the context of procedures, policy, and field environment when operated as planned. Suitability issues include support, documentation, human factors, training, and procedures.

Shakedown testing is conducted to:

- a. Identify and evaluate the risk associated with deployment of the system.
- b. Identify any hardware or software modifications required prior to deployment.

c. Identify any critical issues that may have an adverse impact on system operation in the field.

d. Verify that the integrated system is ready for full operation within the NAS.

#### 7.2.2 OT&E Shakedown Events/Scope of Testing/Basic Scenarios.

##### 7.2.2.1 Shakedown Test Approach.

Shakedown testing requires a unique approach. The test must evaluate all aspects of the system use and maintenance under realistic field conditions. Previous testing has validated specification and NAS interface requirements.

##### 7.2.2.2 Assumptions.

Shakedown planning is approached with the following assumptions:

a. The system meets all specification and interface requirements.

b. The work force is proven (the system operators and maintainers have the aptitude for the type of work).

##### 7.2.2.3 Focus and Issues.

Shakedown testing is a test of maintainability and useability. Testing focuses on issues and programs that enable use and maintenance of the system and include the following:

a. Human Factors. These include data displays, safety, labor intensiveness, and other user functions.

b. Training. People trained on the system can accomplish assigned tasks.

c. Procedures. Procedures to operate the system are in place and provide straightforward and effective means to accomplish user requirements.

d. Logistics Support. Support meets the maintenance requirements throughout the life cycle of the system.

e. Other Factors. Reliability, maintainability, and availability (RMA), compatibility, and manpower supportability.

This approach is not intended to limit the scope of testing but does provide focus. Some functional testing may be required to satisfy specific user concerns or because previous testing was incomplete due to laboratory constraints at the time.

Test results are rated in terms of operational impact. Based on test results, the risks of use in the field are evaluated. The results are forwarded to AAF-11 in a Quick Look Report that assesses the risks of system deployment and is used to aid the EXCOM chairman in rendering a final deployment decision.

#### 7.2.2.4 Shakedown Test Scope.

Shakedown testing will evaluate the system under realistic field conditions. Testing will be designed to reflect the integrated readiness of people, procedures, and the system to assume operational status. Shakedown will evaluate:

- a. Field operations,
- b. Field hardware and software maintenance,
- c. AOS-530 hardware and software support,
- d. Contractor hardware and software support.

#### 7.3 CRITICAL OT&E SHAKEDOWN ITEMS.

Items critical to the completeness and success of the OT&E Shakedown are:

- a. Availability of the user system and completion of their NADIN II conformance testing.
- b. Successful completion of OT&E Integration and OT&E Operational for user systems.

### 8. SPECIAL RESOURCE SUMMARY.

#### 8.1 TEST ARTICLES.

The WMSCR system will consist of two nodes. The nodes will be located in the NAWPPs at the Atlanta and Salt Lake City Air Route Traffic Control Centers (ARTCCs).

The WMSCR test program will be conducted on individual software elements during development and on the complete system as part of the FAT and SAT.

OT&E Integration and OT&E Operational and OT&E Shakedown will be conducted on the complete system installed in the designated operational environment. A Service "A" Gateway will be made available at the FAA Technical Center and connected to the local node of the NADIN PSN Pilot network to support user testing for categories R and U.

After ORD the WMSCR will assume operational responsibilities for the collection and distribution of weather and NOTAM data. The complete transition is expected to take as long as 1 year. The WMSCR Transition Plan describes the transition from WMSC to WMSCR.

#### 8.2 SPECIAL SUPPORT REQUIREMENTS.

There are no special support requirements for the WMSCR system.

## 9. ACRONYMS AND ABBREVIATIONS.

AI	Inherent Availability
ACW	Engineering, Integration, and Operational Evaluation Service
ADAS	AWOS Data Acquisition System
AFD	Regional Airway Facilities Division
AFE	Facility System Engineering Service
AFS	Airway Facilities Sector
AFTN	Aeronautical Fixed Telecommunication Network
ANS	NAS Transition and Implementation Service
ANW	Weather and Flight Service
AOS	Air Traffic Operational Support Service
APAD	Asynchronous PAD
APMT	Associate PM for Test
ARTCC	Air Route Traffic Control Center
ASD	System Engineering and Development Service
ASE	System Engineering Service
ASU	Acquisition Support
AT	Air Traffic
ATL	NAWPF, Atlanta, Georgia
ATR	Air Traffic Plans and Requirements Service
AWOS	Automated Weather Observation System
AWP	Aviation Weather Processor
CDR	Critical Design Review
CE	Critical Equipment
CFMWP	Central Flow Meteorologist Weather Processor
CNS	Consolidated NOTAM System
CNSP	Consolidated NOTAM System Processor
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
CSC	Computer Software Component
CSCI	Computer Software Configuration Item
CTP	Contractor Test Plan
CTS	Coded Time Source
DID	Data Item Description
DIST	Distribution CSCI of WMSCR
DLP	Data Link Processor
DOD	Department of Defense
DOD/AWN	Department of Defense/Tinker Air Force Base
DRR	Deployment Readiness Review
DT&E	Development Test and Evaluation
DUAT	Direct User Access Terminal
FAA	Federal Aviation Administration
FAT	Factory Acceptance Test
FCM	Federal Coordinator for Meteorological Services
FSDPS	Flight Services Data Processing System
GWDS	Graphics Weather Display System
I/CO	Installation and Check Out
IRD	Interface Requirements Document
JAI	Joint Acceptance Inspection
KAWN	Tinker Air Force Base

LRU	Lowest Repairable/Replaceable Unit
MPS	Maintenance Processor System
MSN	Message Switch Network
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair
MWP	Meteorologist Weather Processor
N/A	Not Applicable
NADIN	National Airspace Data Interchange Network
NAS	National Airspace System
NAWPF	National Aviation Weather Processing Facility
NMC	National Meteorological Center (same as NWSTG)
NMSBR	NAS Master Schedule Baseline Report
NOTAM	Notice to Airmen
NSSFC	National Severe Storms Forecast Center
NWS	National Weather Service
NWSTG	National Weather Service Telecommunications Gateway
OPS	Operations CSCI of WMSCR
ORD	Operational Readiness Date
OT&E	Operational Test and Evaluation
PAD	Packet Assembler/Disassembler
PAT&E	Production Acceptance Test and Evaluation
PD	Program Directive
PIDB	Product Information Data Base
PM	Program Manager
PSN	Packet Switching Network
QRO	Quality Reliability Officer
RMA	Reliability, Maintainability, and Availability
RWP	Real-time Weather Processor
SAT	Site Acceptance Test
SCN	Specification Change Notice
SEIC	System Engineering and Integration Contractor
SIDB	Station Information Data Base
SLC	Salt Lake City, Utah - The NAWPF
SSR	Software Specification Review
STP	Software Test Plan
T&E	Test and Evaluation
TBED	Test Bed CSCI of WMSCR
TEMP	Test and Evaluation Master Plan
TMP	Traffic Management Processor
TPRC	Test Policy Review Committee
TVRTM	Test Verification Requirements Traceability Matrix
UT	Unit Test
VRTM	Verification Requirements Traceability Matrix
WCP	Weather Communications Processor (now DLP)
WMO	World Meteorological Organization
WMSC	Weather Message Switching Center
WMSCR	Weather Message Switching Center Replacement

**APPENDIX A**

**TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX (TVRTM), NAS-SS-1000**



VOLUME I TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX - TVRTM

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE FOR NAS-SS-1000 VOL I (SCH-13)		VERIFICATION LEVEL AND METHOD			TEST PLAN IMPLEMENTATION		NAS QUAL STATUS
PARA #	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	OT&E INTEG	OT&E SECON	
3.2.1.1.4.1.A	ACCEPT INFO FM EXT SUBSYSTEMS	X	D	D	D		Q (1)
3.2.1.1.4.1.B	COLLECT/SENSE WY INFO	X	D	D	D		
3.2.1.1.4.1.C	PROVIDE FOR GROWTH/EXPANSION	A	X	V	A		
3.2.1.1.4.1.E	ACCEPT INPUT FROM SPECIALISTS	X	D	X	D		
3.2.1.1.4.1.F	MAINTAIN CURRENT/TREND/FORECAST WY	X	D	X	D		
3.2.1.1.4.1.H	ARCHIVE WY INFO	X	D	X	D		
3.2.1.1.4.1.P	MAINTAIN NOTAM INFO FOR RESP AREA	X	D	X	D		
3.2.1.1.4.1.Q	ACCESS NOTAM INFO BY LOC/GEO AREA	X	D	X	D		
3.2.1.1.8.1.3	DATA AND VOICE ARCHIVING	A	D	D	AD		
3.2.1.1.9.1.A	CONTINUALLY MONITOR SUBSYSTEMS	X	D	X	D		
3.2.1.1.9.1.B	STATUS AND ALARMS	X	D	X	D		
3.2.1.1.9.1.C	ON-SITE, OFF-SITE CONTROL	X	D	X	D		
3.2.1.1.9.1.D	IDENTIFY MALFUNCTIONING LRU	X	D	X	D		
3.2.1.1.9.1.G	SPECIALIST ACCESS TO SUBSYSTEM	X	D	D	D		
3.2.1.2.4.A.4.A	COLLECT TERMINAL FORECAST DATA	X	T	X	T		
3.2.1.2.4.A.4.B	COLLECT AREA FORECAST DATA	X	T	X	T		
3.2.1.2.4.A.4.C	COLLECT WINDS ALOFT FORECASTS	X	T	X	T		
3.2.1.2.4.A.4.D	COLLECT CURRENT SURFACE WY OBS	X	T	X	T		
3.2.1.2.4.A.4.E	COLLECT CURRENT WY CONDITIONS ALOFT	X	T	X	T		
3.2.1.2.4.A.4.F	COLLECT WY WARNINGS AND ADVISORIES	X	T	X	T		
3.2.1.2.4.A.5	COLLECT DOO GENERATED DATA	X	T	X	T		
3.2.1.2.5.B.1.A	DISSEMINATE TERMINAL HAZ WY INFO	X	T	X	T		Q (1) Q
3.2.1.2.5.B.1.B	DISSEMINATE EN ROUTE HAZ WY INFO	X	T	X	T		
3.2.1.2.4.B.4	DISSEMINATE CURRENT SURFACE WY OBS	X	DT	T	T		
3.2.1.2.4.B.5	WY COND ALOFT INFO TO SPECIALIST	X	DT	T	T		
3.2.1.2.4.B.6	STORED WY/AERO INFO DISSEMINATION	X	DT	T	T		
3.2.1.2.4.C.5	MAINT NOTAM FORCE IN 1 HR AFTER EXP	X	T	X	T		
3.2.1.2.4.E.4	FILTER, DECODE, EDIT, REFORMAT DATA	X	D	X	D		
3.2.1.2.4.G	ARCHIVE ALL DATA	X	T	X	T		
3.2.1.2.8.3.A	RECORD OPERATIONAL VOICE AND DATA	X	D	X	D		
3.2.1.2.8.3.B.1	PLAYBACK/RETRIEVE VOICE RECORDINGS	X	T	T	X (1)	X (1)	
3.2.1.2.8.3.B.2	PLAYBACK/RETRIEVE DATA RECORDING	X	D	D	D		
3.2.1.2.8.4.B	NON-ATC SYS/SYNC TO UTC +/- 6SECS	X	T	T	T		
3.2.1.2.8.4.C	PROVIDE INTERFACE TO CTS & SYNC	X	X	I	I		
3.2.1.2.9.A	CONT MONITOR S/S STATUS & ALARMS	X	T	X	T		
30.1.1.1.S	MONITOR SUBSYS PERFORMANCE PARAMS	D	D	X	D		
30.1.1.2.S	SUBSYS OPERATION STATUS DATA	D	D	X	D		
30.1.1.3.S	S/S STATUS, STATE CHGS, ALARMS/ALERTS	D	D	X	D		
30.1.1.4.S	STORE S/S PERP DATA IN LOCAL FILE	D	D	X	D		
30.1.1.5.S	PROVIDE S/S DATA ON RWS REQ	D	D	X	D		
30.1.1.6.S	ALARM - PARAM OUT OF TOLERANCE	D	D	X	D		
30.1.1.9.S	RETURN-TO-NORMAL ALARM	D	D	X	D		
30.1.1.10.S	S/S PARAM OUTSIDE RANGE ALERT	D	D	X	D		
30.1.1.11.S	SET/CHANGE ALARM PARAM RANGES	D	D	X	D		
30.1.1.12.S	DISABLE ALARM/ALERT ON-SITE SPC	D	D	X	D		
30.1.1.13.S	REPORT ALARM/ALERT DISABLING	D	D	X	D		

VOLUME I TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX - TVRTM

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE FOR NAS-SS-1000 VOL I (SCH-13)		VERIFICATION LEVEL AND METHOD			TEST PLAN IMPLEMENTATION		NAS QUAL STATUS
PARA #	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	OT&E INTEG	OT&E SEKDN	
30.1.1.14.S	PROVIDE S/S CERT DATA ON REQ	D	D	X	X (2)	X (2)	Q
30.1.1.15.S	PROVIDE DIAG DATA ON REQ	D	D	X	X (3)	X (3)	Q
30.1.1.18.S	CHANGE OPERATING MODE	D	D	X	D		
30.1.1.19.S	CAPABILITY TO ADJ SELECTED PARAMS	D	D	X	D		
30.1.1.20.S	CAPABILITY TO RESET S/S	D	D	X	D		
30.1.1.21.S	INIT S/S DIAGNOSTIC TEST	D	D	X	D		
30.1.1.22.S	INIT S/S CERT EXERCISES	D	D	X	X (2)	X (2)	Q (2)

NOTES: (1) Neither the present WMSC nor the new WMSCR have any voice recording or playback requirements or capability.

(2) The WMSCR does not require certification.

(3) WMSCR provides "STATUS ONLY ON REQUEST"

METHODS & IMPLEMENTATION T = Test I = Inspection  
D = Demonstration A = Analysis  
X = Not Applicable

NAS QUAL STATUS Q = Deferred (Does not exist in current NAS)  
P = Previously qualified (will not be redone)  
R = Redemonstration of previous qual

VOLUME II TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX - TVRTM

SECTION 3 REQUIREMENTS PARAGRAPHS REFERENCE FOR NAS-SS-1000 VOL II (SCH-13)		VERIFICATION LEVEL AND METHOD			TEST PLAN IMPLEMENTATION		NAS QUAL STATUS
PARA #	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	OT&E INTEG	OT&E SHDN	
3.2.1.5.7.1	FUNCTIONAL CHARACTERISTICS	L	L	X	L		
3.2.1.5.7.1.1.1	DATA BASE MAINTENANCE	D	D	X	D		
3.2.1.5.7.1.1.2	DATA IDENTIFICATION	D	D	X	D		
3.2.1.5.7.1.2.A	REFORMAT	D	D	X	D		
3.2.1.5.7.1.2.B	IDENTIFY AND PROCESS	L	X	L	L		
3.2.1.5.7.1.2.B.1	SAO	D	D	X	D		
3.2.1.5.7.1.2.B.2	WMO	D	D	X	D		
3.2.1.5.7.1.2.B.3	ICAO	D	D	X	D		
3.2.1.5.7.1.2.B.4	OPCM	D	D	X	D		
3.2.1.5.7.1.3	DATA COLLECTION AND DISTRIBUTION	D	D	X	X	X	N/A-TITLE
3.2.1.5.7.1.3.1.A	SURFACE OBS DATA COLLECTION	D	D	D	D		
3.2.1.5.7.1.3.1.B	FORECAST DATA COLLECTION	D	D	D	D		
3.2.1.5.7.1.3.1.C	UPPER AIR OBS COLLECTION	D	D	D	D		
3.2.1.5.7.1.3.1.D	PROCESSED NOTAMS FM CESP	D	D	D	X		Q (6)
3.2.1.5.7.1.3.1.E	PROCESSED NOTAMS FM ANP	D	D	D	D		
3.2.1.5.7.1.3.1.F	WX WARNINGS AND ADVISORIES	D	D	D	D		
3.2.1.5.7.1.3.2	DATA DISTRIBUTION	D	D	D	D		
3.2.1.5.7.1.3.3	DATA PRIORITIES	D	D	D	D		
3.2.1.5.7.1.4.A	WX INFO - NAS SUBSYSTEMS	D	D	X	D		
3.2.1.5.7.1.4.B	WX INFO - EXTERNAL USERS	D	D	X	D		
3.2.1.5.7.1.4.C	WX INFO - NATIONAL WEATHER SERVICE	D	D	X	D		
3.2.1.5.7.1.4.D	WX INFO - INTERNATIONAL	D	D	X	D		
3.2.1.5.7.1.5.A	PROVIDE ALL BACKUP FUNCTIONS	D	D	X	D		
3.2.1.5.7.1.5.B	EXCHANGE DATA	D	D	X	D		
3.2.1.5.7.1.6	OPERATOR INTERVENTION	D	D	X	D		
3.2.1.5.7.1.7.1	MAINTENANCE MONITORING	D	D	X	D		
3.2.1.5.7.1.7.2	MAINTENANCE REQUESTS	D	D	X	D		
3.2.1.5.7.1.8	MAINTENANCE DATA	D	D	X	X (5)	X (5)	
3.2.1.5.7.1.9	MAINTENANCE COMMANDS	D	D	X	X (5)	X (5)	
3.2.1.5.7.1.10.A	REQUEST REPLY - INTERNATIONAL USERS	D	D	X	D		
3.2.1.5.7.1.10.B	REQUEST REPLY - MILITARY OFFICES	D	D	X	D		
3.2.1.5.7.1.10.C	REQUEST REPLY - SERVICE EXT SUBSCRIBERS	D	D	X	D		
3.2.1.5.7.1.11	STANDARD TIME SOURCE	D	D	X	D		
3.2.1.5.7.2	PERFORMANCE CHARACTERISTICS	L	L	X	L		
3.2.1.5.7.2.1	DATA RETENTION	T	T	X	T		
3.2.1.5.7.2.1.A	SURFACE OBSERVATIONS	T	T	T	T		
3.2.1.5.7.2.1.B	UPPER AIR OBSERVATIONS	T	T	T	T		
3.2.1.5.7.2.1.C	PIREPS	T	T	T	T		
3.2.1.5.7.2.1.D	FORECAST DATA	T	T	T	T		
3.2.1.5.7.2.1.E	METEOROLOGICAL DISCUSSION PRODUCTS	T	T	T	T		
3.2.1.5.7.2.1.F	WX WARNINGS AND ADVISORIES	T	T	T	T		
3.2.1.5.7.2.2	ROUTINE THROUGHPUT	D	D	D	D		
3.2.1.5.7.2.3	DATA REQUESTS/URGENT THROUGHPUT	AT	T	X	AT		
3.2.1.5.7.2.4	MESSAGE DISTRIBUTION	AT	T	X	X	X	N/A-TITLE
3.2.1.5.7.2.4.1.A	MESSAGE PRIORITY LEVEL 1	D	D	D	D		
3.2.1.5.7.2.4.1.B	MESSAGE PRIORITY LEVEL 2	D	D	D	D		

VOLUME II TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX - TVRTM

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE FOR NAS-SS-1000 VOL II (SCH-13)		VERIFICATION LEVEL AND METHOD			TEST PLAN IMPLEMENTATION		NAS QUAL STATUS
PARA #	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	OT&E INTEG	OT&E SECON	
3.2.1.5.7.2.4.1.C	MESSAGE PRIORITY LEVEL 3	D	D	D	D		
3.2.1.5.7.2.4.1.D	MESSAGE PRIORITY LEVEL 4	D	D	D	D		
3.2.1.5.7.2.4.1.E	MESSAGE PRIORITY LEVEL 5	D	D	D	D		
3.2.1.5.7.2.4.2	PRIORITY RECOGNITION	D	D	D	D		
3.2.1.5.7.2.5	OPERATION	X	D	X	D		
3.2.1.5.7.2.6	MESSAGE JOURNALLING	D	D	X	D		
3.2.1.5.7.2.7	MAINTENANCE REPORTING PERFORMANCE	ADT	DT	T	AT		
3.2.1.5.7.2.8	STANDARD TIME SOURCE	T	T	T	T		
3.2.1.5.7.3-1.A	ADAS TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.B	AWN TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.C	WNSCR TO AWW	X	D	X	D		
3.2.1.5.7.3-1.D	AWP TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.E	WNSCR TO AWP	X	D	X	D		
3.2.1.5.7.3-1.F	CPNMP TO WNSCR	X	D	X	D		Q (1)
3.2.1.5.7.3-1.G	WNSCR TO CPNMP	X	D	X	D		Q (2)
3.2.1.5.7.3-1.H	CHSP TO WNSCR	X	D	X	D		Q (6)
3.2.1.5.7.3-1.I	WNSCR TO CHSP	X	D	X	D		Q (6)
3.2.1.5.7.3-1.J	DUAT TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.K	WNSCR TO DUAT	X	D	X	D		
3.2.1.5.7.3-1.L	EKT USER TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.M	WNSCR TO EKT USER	X	D	X	D		
3.2.1.5.7.3-1.N	WNSCR TO GWS	X	D	X	D		Q (7)
3.2.1.5.7.3-1.O	INTL USER TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.P	WNSCR TO INTL USER	X	D	X	D		
3.2.1.5.7.3-1.Q	NPS TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.R	WNSCR TO NPS	X	D	X	D		
3.2.1.5.7.3-1.S	MWP TO WNSCR	X	D	X	D		Q (1)
3.2.1.5.7.3-1.T	WNSCR TO MWP	X	D	X	D		Q (2)
3.2.1.5.7.3-1.U	WNC TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.V	WNSCR TO WNC	X	D	X	D		
3.2.1.5.7.3-1.W	WSSPC TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.X	WNSCR TO WSSPC	X	D	X	D		
3.2.1.5.7.3-1.Y	OTHER WNSCR TO WNSCR	X	D	X	D		
3.2.1.5.7.3-1.Z	WNSCR TO OTHER WNSCR	X	D	X	D		
3.2.1.5.7.3-1.AA	RWP TO WNSCR	X	D	X	D		Q (3)
3.2.1.5.7.3-1.AB	WNSCR TO RWP	X	D	X	D		Q (3)
3.2.1.5.7.3-1.AC	WNSCR TO TWP	X	D	X	D		Q (4)
3.2.1.5.7.3-1.AD	WNSCR TO WCP	X	D	X	D		
3.2.1.5.7.3-1.AE	WNSCR TO WNSCR OPERATOR	X	D	X	D		
3.2.1.5.7.3-1.AF	WNSCR OPERATOR TO WNSCR	X	D	X	D		

NOTES:

(1) Input from Phase 1 MWP and CPNMP to WNSCR is via CRSU LABS GS-200.  
End-state (Phase 2) systems not scheduled until 1995/96.

(2) Neither the WNSC nor the WNSCR will provide any output to the MWP/CPNMP.  
All MWP/CPNMP inputs are via satellite from contractor hub facility.

VOLUME II TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX - TVRTM

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE FOR NAS-SS-1000 VOL II (SCH-13)		VERIFICATION LEVEL AND METHOD			TEST PLAN IMPLEMENTATION		NAS QUAL STATUS
PARA #	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	OT&E INTEG	OT&E SEKDN	

(3) The RWP project is on hold.

(4) There is no active TMP project at this time.

(5) WMSR provides "STATUS ONLY ON REQUEST"

(6) CMSP is not available

(7) GADS is not available

METHODS & IMPLEMENTATION  
 T = Test I = Inspection  
 D = Demonstration A = Analysis  
 X = Not Applicable

NAS QUAL STATUS  
 Q = Deferred (Does not exist in current NAS)  
 P = Previously qualified (will not be redone)  
 R = Redemonstration of previous qual

**VOLUME V TEST VERIFICATION REQUIREMENTS TRACEABILITY MATRIX - TVRTH**

SECTION 3 REQUIREMENTS PARAGRAPH REFERENCE FOR NAS-SS-1000 VOL V (SCH-12)		VERIFICATION LEVEL AND METHOD			TEST PLAN IMPLEMENTATION		NAS QUAL STATUS
PARA #	TITLE	SUBSYS LEVEL	INTEG LEVEL	SITE LEVEL	OT&E INTEG	OT&E SECON	
3.2.1.1.4.1.1	S/S STATUS/PERFORMANCE MONITORING	D	D	X	D		
3.2.1.1.4.1.2	REAL TIME MONITORING	D	D	X	D		
3.2.1.1.4.1.3	LOCAL DATA FILE	D	D	X	D		
3.2.1.1.4.1.4	DATA REPORT	X	X	D	X (1)		
3.2.1.1.4.1.5	OPERATING STATUS	D	D	X	D		
3.2.1.1.4.1.6	S/S/ STATUS RESPONSE	D	D	X	D		
3.2.1.1.4.1.7	S/S ALARM GENERATION	D	D	X	D		
3.2.1.1.4.1.9	RETURN TO NORMAL ALARM	D	D	X	D		
3.2.1.1.4.1.10	S/S ALERT GENERATION	D	D	X	D		
3.2.1.1.4.1.11	ALARM/ALERT PARAMETERS	D	D	X	D		
3.2.1.1.4.1.12	ALARM/ALERT DISABLING	D	D	X	D		
3.2.1.1.4.1.13	ALARM/ALERT DISABLE REPORT	D	D	X	D		
3.2.1.1.4.1.14	CERTIFICATION TEST DATA	D	D	X	X (2)		Q
3.2.1.1.4.1.15	DIAGNOSTIC TEST DATA	D	D	X	X (1)		Q
3.2.1.1.4.1.18	OPERATING MODE CHANGE	D	D	X	D		
3.2.1.1.4.1.19	PARAMETER ADJUSTMENT	D	D	X	X (1)		Q
3.2.1.1.4.1.20	RESET	D	D	X	X (1)		Q
3.2.1.1.4.1.21	FAULT ISOLATION	D	D	X	X (1)		Q
3.2.1.1.4.1.31	CERTIFICATION TEST	D	D	X	X (2)		Q
3.2.1.1.4.2	PERFORMANCE CHARACTERISTICS	L	L	L	L		
3.2.1.1.4.2.1	ALARM/ALERT DETECTION	AT	T	X	AT		
3.2.1.1.4.2.2	CHANGE OF STATE DETECTION	AT	T	X	AT		
3.2.1.1.4.2.3	PERFORMANCE DATA REPORT	AT	T	X	AT (3)		
3.2.1.1.4.2.4	CONTROL COMMANDS	AT	T	X	X (4)		Q
3.2.1.1.4.2.5	COMMAND ACKNOWLEDGEMENT	AT	T	X	X (4)		Q
3.2.1.1.4.2.6	MESSAGE TRANSFER	AT	T	X	X (5)		Q
3.2.1.1.4.2.7	OPERATING MODES	D	D	X	D		
3.2.1.1.4.2.8	MESSAGE PRIORITY	D	D	X	D (1)		
3.2.1.1.6.3-1.CY	NPS TO WNSCR	X	D	X	D (6)		Q
3.2.1.1.6.3-1.CZ	WNSCR TO NPS	X	D	X	D (6)		Q

- NOTES:**
- (1) WNSCR provides "STATUS ONLY ON REQUEST"
  - (2) The WNSCR has not been designated as a certifiable system.
  - (3) STATUS data only
  - (4) STATUS ONLY - No commands accepted
  - (5) STATUS ONLY - No RMS message transfer
  - (6) STATUS ONLY - No Maintenance Maintenance Requests or Data

**METHODS & IMPLEMENTATION**

T = Test                      I = Inspection  
D = Demonstration    A = Analysis  
X = Not Applicable

**NAS QUAL STATUS**

Q = Deferred (Does not exist in current NAS)  
P = Previously qualified (will not be redone)  
R = Redemonstration of previous qual